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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,088	05/31/2006	Hiroshi Oshitani	4041J-001125/US/NP	2089

27572 7590 09/22/2009

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EXAMINER	
COMINGS, DANIEL C	

ART UNIT	PAPER NUMBER
3744	

MAIL DATE	DELIVERY MODE
09/22/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,088	OSHITANI ET AL.	
	Examiner	Art Unit	
	Daniel C. Comings	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22-55* is/are pending in the application.

4a) Of the above claim(s) *23,24,28,29,31,32,34-49 and 51-55* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22,25-27,30,33 and 50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *31 May 2006, 6 December 2007 and 7 July and 24 August, both 2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group 1 (claims 22, 25-27, 30, 33 and 50) in the reply filed on 5 August 2009 is acknowledged. The traversal is on the grounds that no Lack of Unity of Invention requirement was issued during the examination of the PCT application of which the instant case is a National Stage Entry. This is not found persuasive because, as explained and illustrated in the Requirement for Restriction/Election mailed on 26 June 2009 by the Office, the present application contains multiple inventions that lack Unity of Invention.

The requirement is still deemed proper and is therefore made FINAL.

Claims 23, 24, 28, 29, 31, 32, 34-49 and 51-55 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 5 August 2009.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 25 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In lines 2 and 3 of claim 25, the teaching that the third evaporator "evaporates refrigerant to have a cooling capacity in a temperature zone that is the same as that of the first evaporator" fails to specify what, exactly, a "temperature zone" is or how broad a range such a zone covers and thus renders the claim indefinite.

For purposes of examination, examiner has interpreted the phrase "temperature zone" to mean "range of temperatures."

Claim 26 is rejected as depending upon a rejected base claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 22 is rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 6,651,451 B2 to Cho et al..

Cho teaches limitations from claim 22 in fig. 10, shown on pg. 4 of this action, an ejector-type refrigerant cycle device, comprising:

a compressor (12) that sucks and compresses refrigerant;

a radiator (14) that radiates heat from the high-pressure refrigerant discharged from the compressor;

an ejector (vortex generator 52, disclosed in col. 8, lines 7-11 and 34-36 as an ejector) having a nozzle portion (the body of the vortex generator) that depressurizes and expands

refrigerant on a downstream side of the radiator (the position of the vortex generator 52 is shown in fig. 10), and a refrigerant suction port (inlet 82) through which refrigerant is sucked by the flow of refrigerant jetted at high speed from the nozzle portion (the function of the vortex generator is described in lines 36-50 of col. 7);

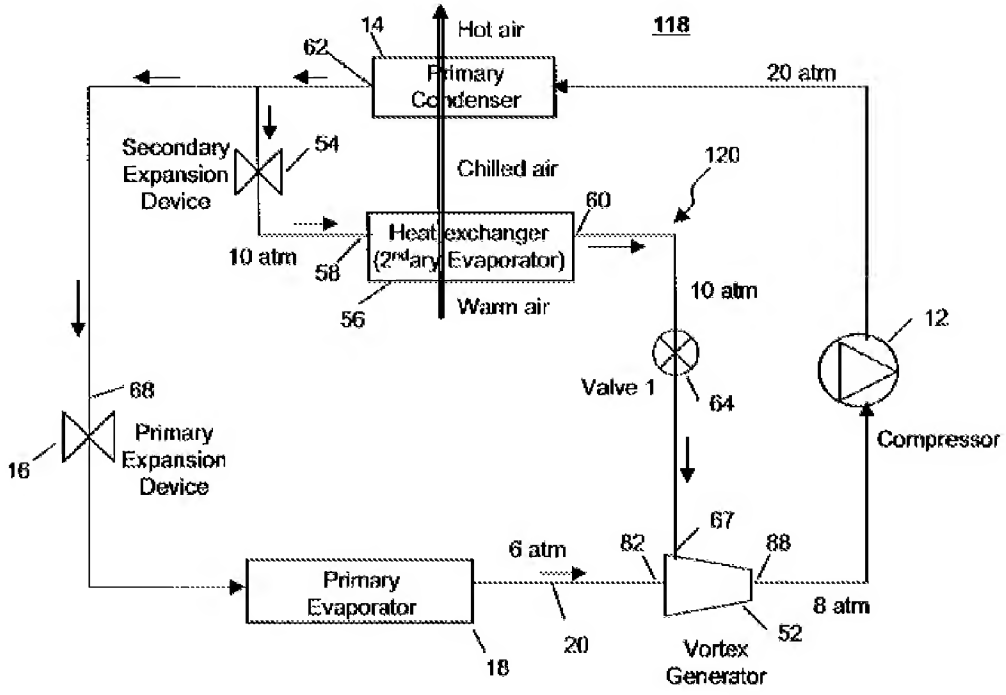


FIG. 10

a first evaporator (2nd ary evaporator 56) having a refrigerant outflow side connected to a suction side of the compressor (through the vortex generator 52);

a first branch passage (the passage containing primary evaporator 18 and primary expansion device 16) that branches a flow of refrigerant upstream of the ejector and guides the branched flow of refrigerant to the refrigerant suction port (82);

a first throttling means (primary expansion device 16) that is disposed in the first branch passage and depressurizes and expands refrigerant (as taught by the name “primary expansion device”); and

a second evaporator (18) that is disposed in the first branch passage downstream of the first throttling means (16), wherein:

a refrigerant evaporating pressure of the second evaporator is lower than a refrigerant evaporating pressure of the first evaporator (as shown in fig 10, refrigerant passing through evaporator 56 has a pressure of 10 atm and the refrigerant passing through evaporator 18 has a pressure of 6 atm, thus meeting the claimed limitation); and

the first throttling means is provided with a fully opening function (implicitly, as the device will, by definition, be fully open when it is at it's maximum opening degree), and fully opens the first branch passage when the second evaporator is defrosted (the system of Cho is capable of being operated in this way); (col. 5, lines 19-21 and col. 8, lines 48-56.)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

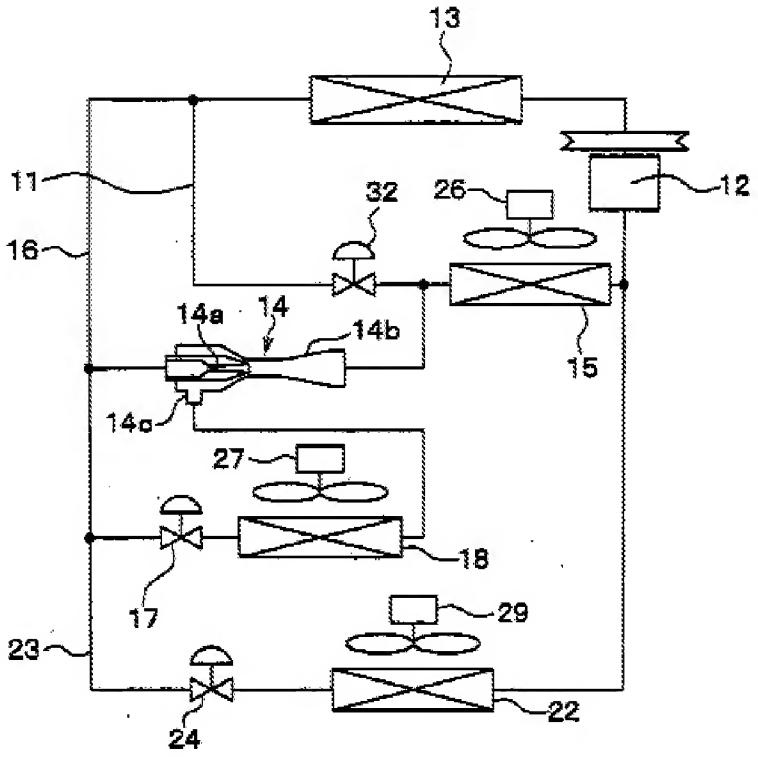
> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 22, 25, 26, 27, 30 and 33 rejected under 35 U.S.C. 102(e) as being anticipated by US Publication 2005/0178150 A1 to Oshitani et al..

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in

the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

FIG. 11



Oshitani teaches limitations from claim 22 in fig. 11, shown above, an ejector-type refrigerant cycle device, comprising:

a compressor (12) that sucks and compresses refrigerant;

a radiator (13) that radiates heat from the high-pressure refrigerant discharged from the compressor;

an ejector (14) having a nozzle portion (14a) that depressurizes and expands refrigerant on a downstream side of the radiator (as shown), and a refrigerant suction port (14c) through

which refrigerant is sucked by the flow of refrigerant jetted at high speed from the nozzle portion;

a first evaporator (15) having a refrigerant outflow side connected to a suction side of the compressor;

a first branch passage (containing control valve 17 and evaporator 18) that branches a flow of refrigerant upstream of the ejector and guides the branched flow of refrigerant to the refrigerant suction port (as shown);

a first throttling means (control valve 17) that is disposed in the first branch passage and depressurizes and expands refrigerant; and

a second evaporator (18) that is disposed in the first branch passage downstream of the first throttling means, wherein:

a refrigerant evaporating pressure of the second evaporator is lower than a refrigerant evaporating pressure of the first evaporator (as taught in ¶ 115 on pg. 8); and

the first throttling means is provided with a fully opening function (implicitly, as the device will, by definition, be fully open when it is at it's maximum opening degree), and fully opens the first branch passage when the second evaporator is defrosted (the system of Oshitani is capable of being operated in this way); (pg. 3, ¶ 48 and 50 and pg. 4, ¶ 54.)

Oshitani teaches limitations from claim 25 in fig. 11, shown on pg. 11 of this action, the ejector-type refrigerant cycle device according to claim 22, further comprising: a third evaporator (22) that evaporates refrigerant to have a cooling capability in a temperature zone that is the same as that of the first evaporator (noted above, examiner has interpreted the phrase "temperature zone" to mean "range of temperatures", thus the cooling capability of the refrigerant in the third evaporator is inherently in the same range of temperatures

as the first evaporator, that range being the range of refrigerant temperatures occurring within the refrigeration cycle device of Oshitani.)

Oshitani teaches limitations from claim 26 in fig. 11, shown on pg. 6 of this action, the ejector-type refrigerant cycle device according to claim 25, further comprising: a second branch passage (23) that branches the flow of refrigerant at a portion of the first branch passage positioned upstream of the first throttling means (as shown) and joins the branched flow of refrigerant to the flow of refrigerant between the refrigerant outflow side of the first evaporator (15) and the suction side of the compressor (12) (as shown); and a second throttling (24) means that is disposed in the second branch passage (as shown) and depressurizes and expands refrigerant, wherein the third evaporator (22) is disposed in the second branch passage downstream of the second throttling means (as shown); (pg. 6, ¶ 88-89.)

Oshitani teaches limitations from claim 27 in fig. 11, shown on pg. 6 of this action, the ejector-type refrigerant cycle device according to claim 22, wherein the first evaporator (15) is connected to a refrigerant outflow side (14b) of the ejector (14) (as shown).

Oshitani teaches limitations from claim 30 in fig. 11, shown on pg. 6 of this action, the ejector-type refrigerant cycle device according to claim 22, further comprising a third throttling means (32) that is provided between a refrigerant outflow side of the radiator (13) and a refrigerant inflow side of the first evaporator (15), wherein the ejector (14) is provided in parallel with the third throttling means (as shown), (pg. 8, ¶ 110.)

Oshitani teaches limitation from claim 33 in fig. 11, shown on pg. 6 of this action, ejector-type refrigerant cycle device according to claim 22, further comprising: a shut mechanism (control valve 17) that shuts a passage area located upstream of the ejector (as shown) when the second evaporator is defrosted (the system of Oshitani is capable of being operated in this way, as it would allow the flow of refrigerant into the evaporator to be halted in order to be more effectively defrosted.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

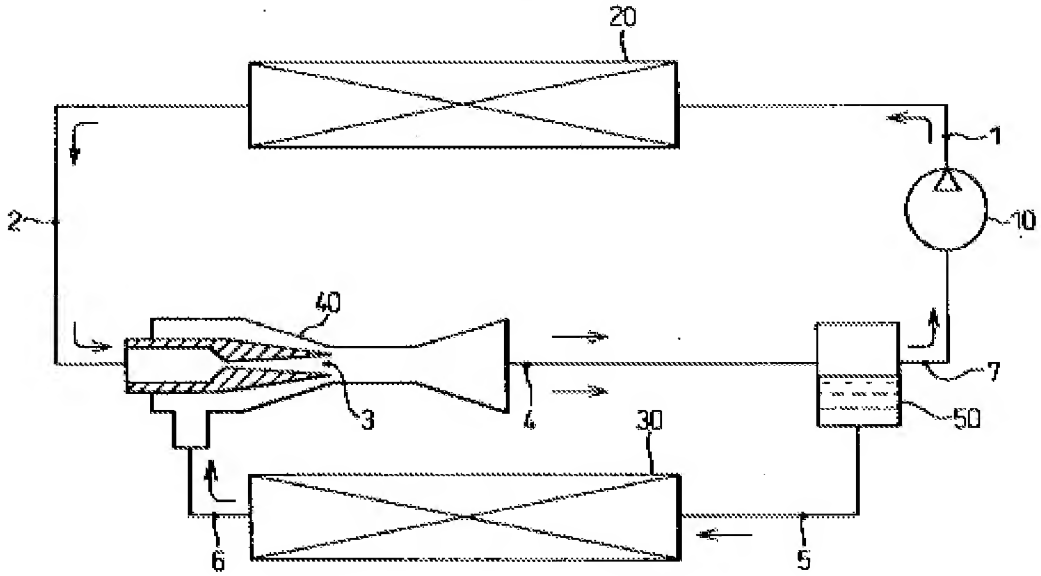
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oshitani as applied to claim 22 above, and further in view of US Publication No. 2003/0167793 A1 to Honda et al..

Oshitani teaches a refrigeration cycle system having a compressor, a refrigeration cycle device with a compressor, a radiator, an ejector, a first evaporator on the suction side of the compressor, a branch passage located upstream from the ejector guiding refrigerant through a throttling valve and a second evaporator and into the ejector. Oshitani does not teach the placement of a vapor-liquid separator on the outflow side of the first evaporator. Such a separator is well known in the art as

illustrated by Honda. Honda teaches in fig. 1, shown below, an ejector cycle system having an vapor-liquid separator (50) on the downstream side of an evaporator (30) feeding vapor refrigerant to the compressor (10) while retaining liquid refrigerant both in itself and in the circuit of pipe that includes the separator (50), the evaporator (30) and the ejector (40); (pg 2, ¶ 39.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Oshitani with the separator of Honda in order to ensure that entrained liquid refrigerant does not enter the compressor where it could cause damage to compressor components thus leading to reduced performance or even mechanical failure.

Fig.1



Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel C. Comings whose telephone number is 571-270-7385. The examiner can normally be reached on Mon-Fri 8:00-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules or Cheryl Tyler can be reached on 571-272-6681 or 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel C Comings/
Examiner, Art Unit 3744
17 September 2009

/Frantz F. Jules/
Supervisory Patent Examiner, Art Unit 3744